

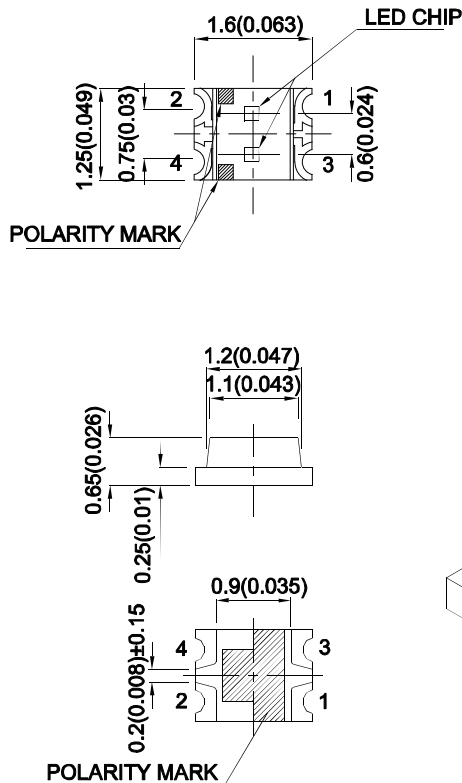


ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

Features

- High reliability LED package.
- 1.6mmx1.25mm SMD LED, 0.65mm thickness.
- Bi-color, low power consumption.
- Wide viewing angle.
- Ideal for backlight and indicator.
- Package : 2000pcs / reel.
- Moisture sensitivity level : level 3.
- RoHS compliant.

Package Dimensions



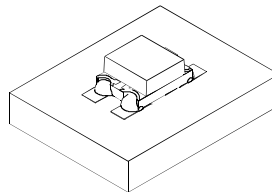
Part Number: APTB1612CGKQWDF-AMT
Green
White

Description

- The Green source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode.
- The source color devices are made with InGaN Light Emitting Diode.
- Electrostatic discharge and power surge could damage the LEDs.
- It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.
- All devices, equipments and machineries must be electrically grounded.

Applications

- Traffic signaling.
- Backlighting (illuminated advertising , general lighting).
- Interior and exterior automotive lighting.
- Substitution of micro incandescent lamps.
- Reading lamps.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. Steps, exit ways, etc).
- Decorative and entertainment lighting.
- Indoor and outdoor commercial and residential architectural lighting.



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.2(0.008)$ unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.



Selection Guide

| Part No. | Emitting Color (Material) | Lens Type | Iv (mcd) [2] @ 20mA | | | Viewing Angle [1] |
|---------------------|---------------------------|--------------------|------------------------|------|------|-------------------|
| | | | Code. | Min. | Max. | 2θ1/2 |
| APTB1612CGKQWDF-AMT | Green (AlGaInP) | Yellow Fluorescent | F | 20 | 40 | 120° |
| | | | G | 40 | 55 | |
| | | | H | 55 | 80 | |
| | White (InGaN) | | M | 80 | 120 | |
| | N | | 120 | 200 | | |
| | P | | 200 | 300 | | |
| | Q | | 300 | 400 | | |

Notes:

1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity / luminous Flux: +/-15%.
3. Luminous intensity value is traceable to the CIE127-2007 compliant national standards.

Absolute Maximum Ratings at TA=25°C

| Parameter | Symbol | Value | | Unit | |
|--|--------------------------------------|--------------------|------------|------------|------|
| | | Green | White | | |
| Power dissipation | PD | 75 | 80 | mW | |
| Operating Temperature | Top | -40 To+ 100 | | °C | |
| Storage Temperature | Tstg | -40 To+ 110 | | °C | |
| Junction temperature | TJ | 115 | 115 | °C | |
| DC Forward Current (TA=25°C) | IF | 30 | 20 | mA | |
| Peak Forward Current [1] (TA=25°C) | IFM | 150 | 150 | mA | |
| Reverse Voltage (TA=25°C) | VR | 5 | 5 | V | |
| Electrostatic Discharge Threshold (HBM) | | 3000 | 250 | V | |
| Thermal resistance (Junction/ambient) | 1 chip on (typ.) 2 chip on (typ.) | Rth j-a Rth j-a | 600 730 | 560 660 | °C/W |

Note:

1. 1/10 Duty Cycle, 0.1ms Pulse Width.

Electrical / Optical Characteristics at TA=25°C (Green)

| Parameter | Symbol | Value | | | | Unit |
|--|--------------------|-------|------|------|------|--------|
| | | Code. | Min. | Typ. | Max. | |
| Wavelength at peak emission I _F =20mA | λ peak | | | 574 | | nm |
| Dominant Wavelength I _F =20mA | λ dom [1] | 5 | 567 | | 569 | nm |
| | | 6 | 569 | | 571 | |
| | | 7 | 571 | | 573 | |
| Spectral bandwidth at 50%Φ _{REL MAX} I _F =20mA | Δλ | | | 20 | | nm |
| Forward Voltage I _F =20mA | V _F [2] | | | 2.1 | 2.5 | V |
| Reverse Current (V _R = 5V) | I _R | | | | 10 | uA |
| Temperature coefficient of λ peak I _F =20mA, -10 ° C ≤ T ≤ 100 ° C | TC λ peak | | | 0.12 | | nm/° C |
| Temperature coefficient of λ dom I _F =20mA, -10 ° C ≤ T ≤ 100 ° C | TC λ dom | | | 0.08 | | nm/° C |
| Temperature coefficient of V _F I _F =20mA, -10 ° C ≤ T ≤ 100 ° C | TC _V | | | -1.8 | | mV/° C |

Notes:

- 1.The dominant Wavelength (λ d) above is the setup value of the sorting machine. (Tolerance λ d : ±1nm.)
- 2.Forward Voltage: +/-0.1V.
- 3.Wavelength value is traceable to the CIE127-2007 compliant national standards.
- 4.Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

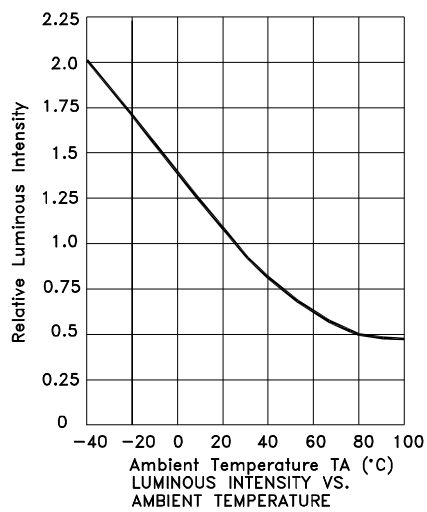
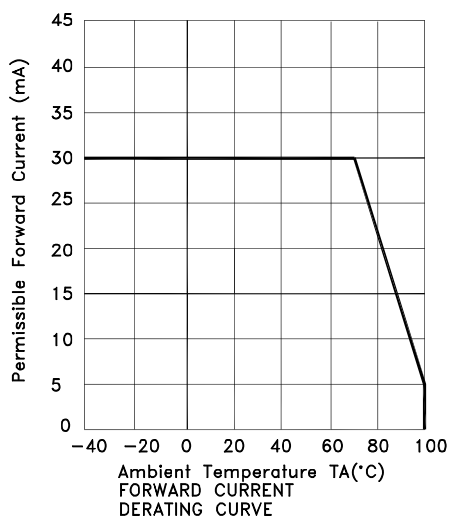
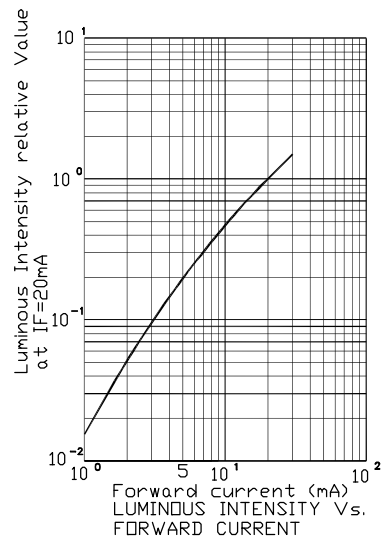
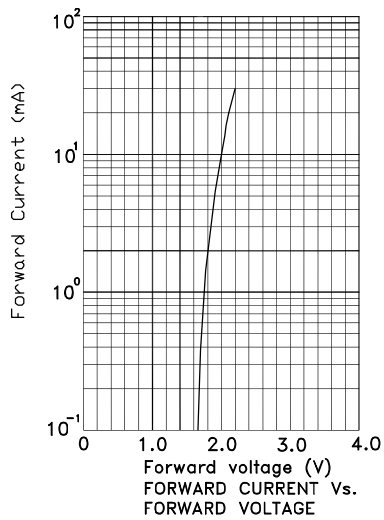
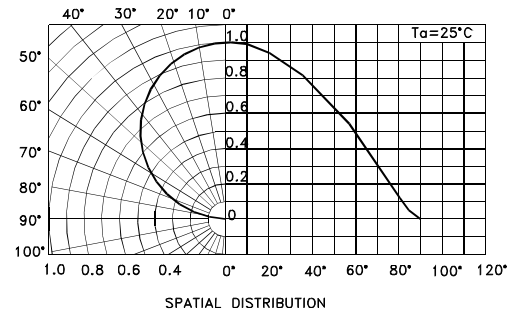
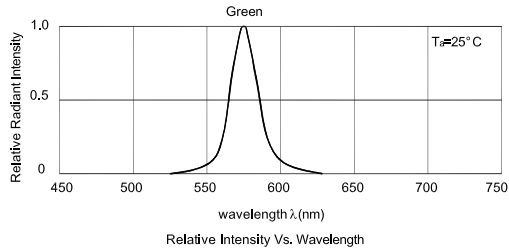
Electrical / Optical Characteristics at TA=25°C (White)

| Parameter | Symbol | Value | Unit |
|---|--------------------|-------|-----------------------|
| Chromaticity coordinate x acc.to CIE1931 I _F =20mA [Typ.] | x [1] | 0.31 | |
| Chromaticity coordinate y acc.to CIE1931 I _F =20mA [Typ.] | y [1] | 0.31 | |
| Reverse Current (V _R = 5V) [Max.] | I _R | 50 | uA |
| Forward Voltage I _F =20mA [Min.] | V _F [2] | - | V |
| Forward Voltage I _F =20mA [Typ.] | | 3.3 | |
| Forward Voltage I _F =20mA [Max.] | | 4.0 | |
| Temperature coefficient of V _F I _F =20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.] | TC _V | -2.0 | mV/° C |
| Temperature coefficient of x I _F =20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.] | TC _x | -0.18 | 10 ⁻³ /° C |
| Temperature coefficient of y I _F =20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.] | TC _y | -0.20 | 10 ⁻³ /° C |

Notes:

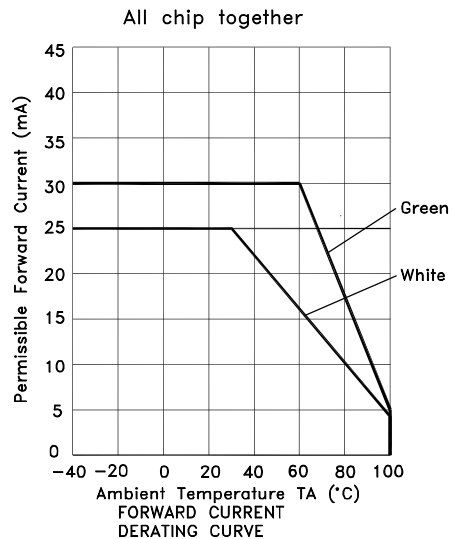
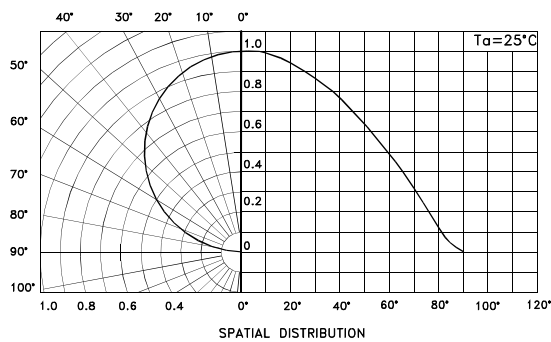
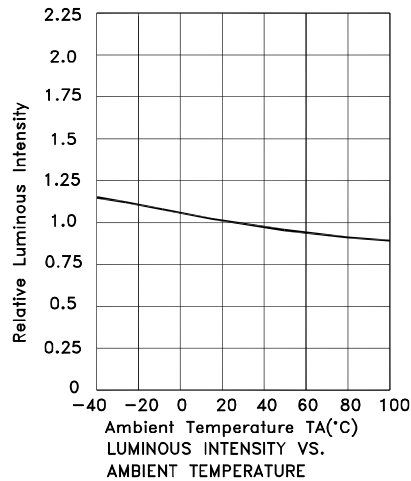
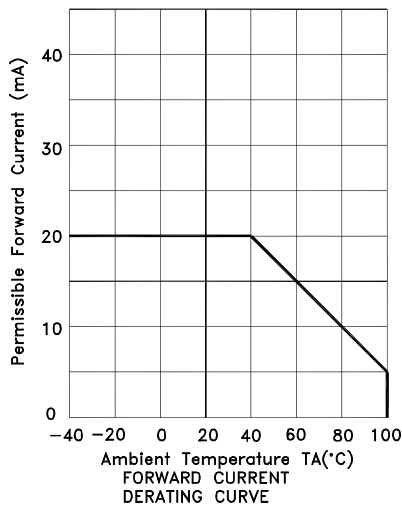
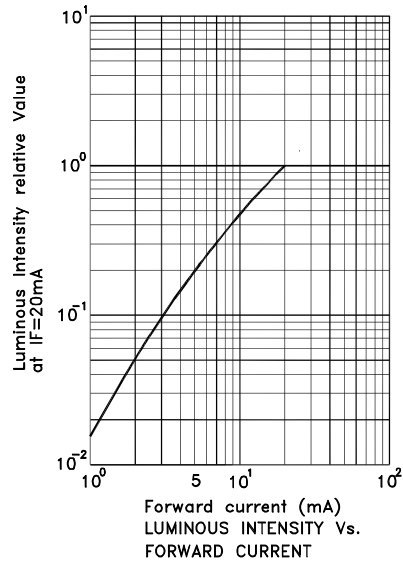
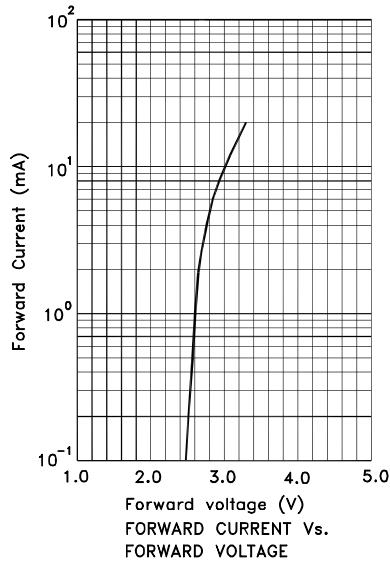
- 1.Measurement tolerance of the chromaticity coordinates is ±0.01.
- 2.Forward Voltage: +/-0.1V.
- 3.Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

APTB1612CGKQWDF-AMT Green



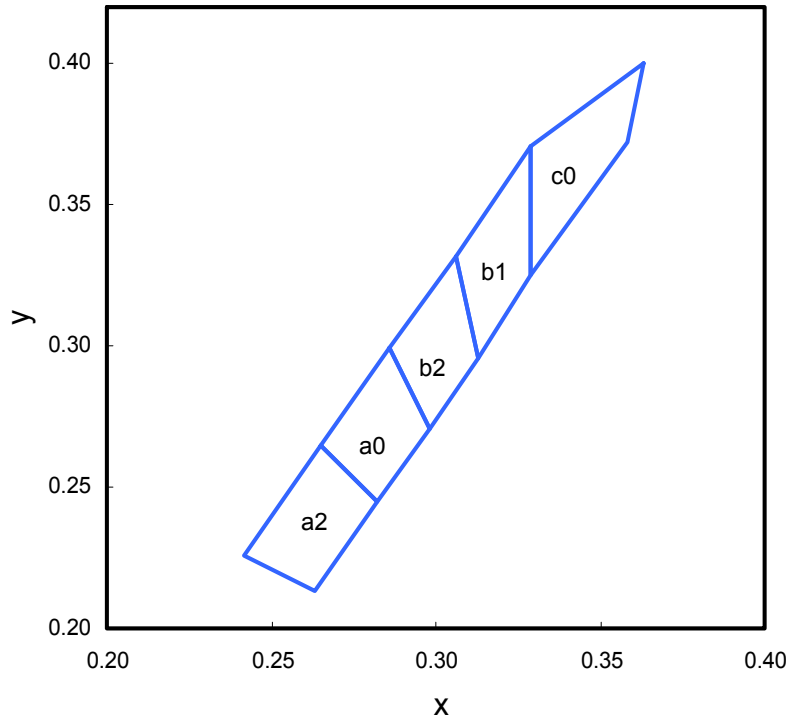
Kingbright

White



APTB1612CGKQWDF-AMT

White CIE



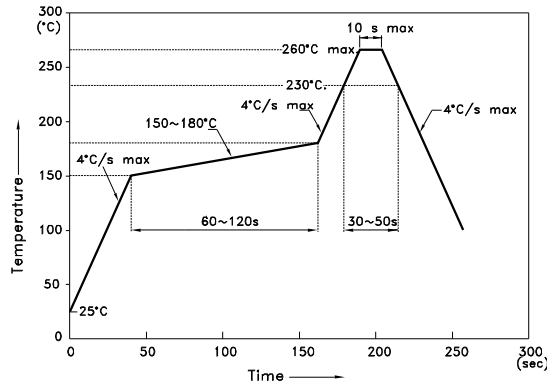
| | x | y | | x | y | | x | y |
|----|-------|-------|----|-------|-------|----|-------|-------|
| a2 | 0.263 | 0.213 | a0 | 0.282 | 0.245 | b2 | 0.298 | 0.271 |
| | 0.282 | 0.245 | | 0.298 | 0.271 | | 0.313 | 0.296 |
| | 0.265 | 0.265 | | 0.286 | 0.299 | | 0.306 | 0.332 |
| | 0.242 | 0.226 | | 0.265 | 0.265 | | 0.286 | 0.299 |
| b1 | 0.313 | 0.296 | c0 | 0.329 | 0.325 | | | |
| | 0.329 | 0.325 | | 0.358 | 0.372 | | | |
| | 0.329 | 0.371 | | 0.363 | 0.400 | | | |
| | 0.306 | 0.332 | | 0.329 | 0.371 | | | |

Notes:
 Shipment may contain more than one chromaticity regions.
 Orders for single chromaticity region are generally not accepted.
 Measurement tolerance of the chromaticity coordinates is ± 0.01 .

APTB1612CGKQWDF-AMT

Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

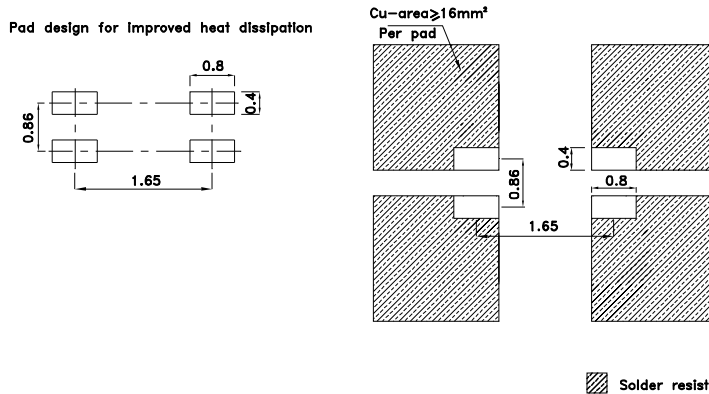
Reflow Soldering Profile For Lead-free SMT Process.



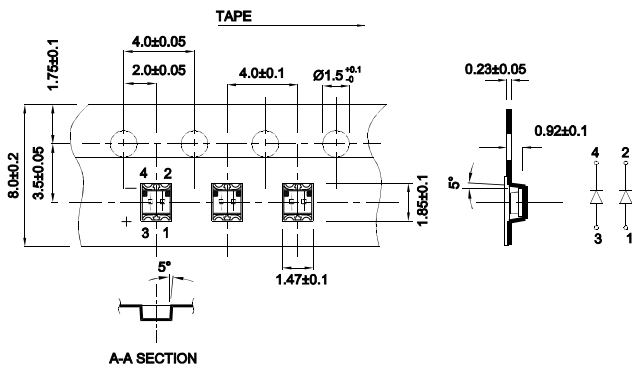
NOTES:

1. We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

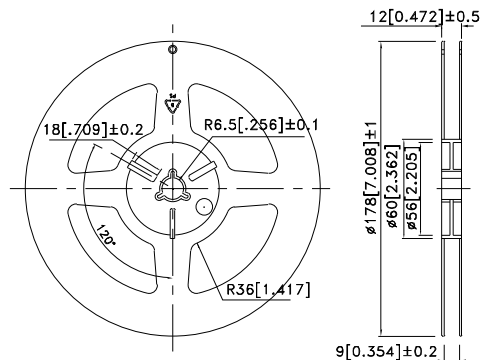
Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)



Tape Dimensions (Units : mm)

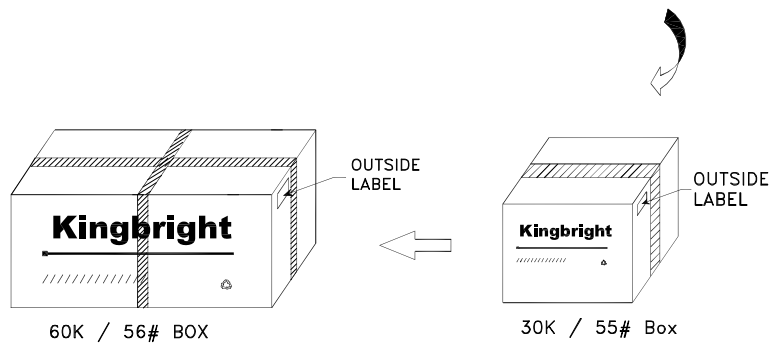
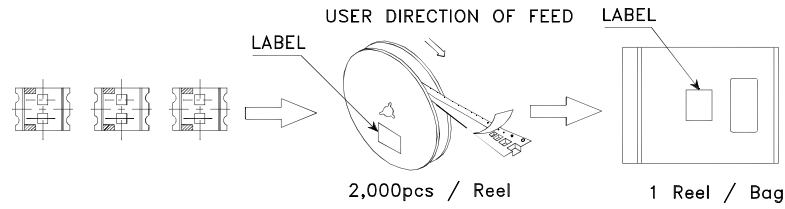



Reel Dimension



PACKING & LABEL SPECIFICATIONS

APTB1612CGKQWDF-AMT



| | |
|---|--|
| Kingbright | |
| P/NO: APTB1612xxx | |
| QTY: 2,000 pcs | Q.C. Q C XX XX XXXX PASSED |
| S/N: XXXX | |
| CODE: XXX | |
| LOT NO: | |
|  <small>XXXXXXXXXXXXXXXXXXXX</small> | |
| RoHS Compliant | |

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Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below

Lot Tolerance Percent Defective (LTPD) : 10%

| No. | Test Item | Standards | Test Condition | Test Times / Cycles | Number of Damaged |
|-----|--------------------------------------|-----------------------|--|---------------------|-------------------|
| 1 | Continuous operating test | - | Ta =25°C ,IF = maximum rated current* | 1,000 h | 0 / 22 |
| 2 | High Temp. operating test | EIAJ ED-4701/100(101) | Ta = 100°C IF =derated current at 100°C | 1,000 h | 0 / 22 |
| 3 | Low Temp. operating test | - | Ta = -40°C, IF = maximum rated current* | 1,000 h | 0 / 22 |
| 4 | High temp. storage test | EIAJ ED-4701/100(201) | Ta = maximum rated storage temperature | 1,000 h | 0 / 22 |
| 5 | Low temp. storage test | EIAJ ED-4701/100(202) | Ta = -40°C | 1,000 h | 0 / 22 |
| 6 | High temp. & humidity storage test | EIAJ ED-4701/100(103) | Ta = 60°C, RH = 90% | 1,000 h | 0 / 22 |
| 7 | High temp. & humidity operating test | EIAJ ED-4701/100(102) | Ta = 60°C, RH = 90% IF = derated current at 60°C | 1,000 h | 0 / 22 |
| 8 | Resistance to Soldering Heat | EIAJ ED-4701/100(301) | TSId=260±5°C, 10 sec | 2 times | 0 / 18 |
| 9 | Thermal shock operating test | - | Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C | 1,000 cycles | 0 / 22 |
| 10 | Thermal shock test | - | Ta = -40°C(15min) ~ 100°C(15min) | 1,000 cycles | 0 / 22 |
| 11 | Electric Static Discharge (ESD) | EIAJ ED-4701/100(304) | C = 100pF , R2 = 1.5KΩ V=3000V(Green) V = 250V(White) | Once each Polarity | 0 / 22 |
| 12 | Vibration test | - | a = 196m/s ² , f = 100~2KHz , t = 48min for all xyz axes | 4 times | 0 / 22 |

* : Refer to forward current vs. derating curve diagram

Failure Criteria

| Items | Symbols | Conditions | Failure Criteria |
|-------------------------|---------|------------------------------------|--|
| luminous Intensity | Iv | IF = 20mA | Testing Min. Value <Spec.Min.Value x 0.5 |
| Forward Voltage | VF | IF = 20mA | Testing Max. Value ≥Spec.Max.Value x 1.2 |
| Reverse Current | IR | VR = Maximum Rated Reverse Voltage | Testing Max. Value ≥Spec.Max.Value x 2.5 |
| High temp. storage test | - | - | Occurrence of notable decoloration, deformation and cracking |